APPENDIX I: Temperature Monitoring Data and Evaluation of Relevant Criteria for Streams within the Fox and Hamilton Allotments

Stream temperature is an important factor affecting distribution and abundance of salmonids within the John Day River Sub-basin. Water temperatures influence water chemistry, as well as every phase of salmonid life history. Optimal temperatures for steelhead are 50˚ to 61˚ F (10˚ to 16˚ C), and the lethal temperature is approximately 77˚ F (25˚ C). Within the John Day River, high stream temperatures occur near the end of July or the beginning of August and coincide with low stream flows and warm daytime temperatures. By the end of August, stream temperatures are typically dropping.

A variety of water temperature standards/desired conditions/criteria are addressed by the MNF when designing land management actions and evaluating their effects. They are described below.

Current Condition & Forest Plan Standards & Guidelines

The Forest Plan water temperature standard and RMO directs the Forest to meet state water quality standards and prevent measurable increases in water temperature (1990 Forest Plan Watershed S&G-2, 1995 PACFISH Water Temperature RMO), and maintain maximum water temperatures below 64°F within migration and rearing habitat and below 60°F within spawning habitats (PACFISH). The Forest Plan Watershed Standards and Guidelines are:

> **2. Water Quality Standards and BMP's.** Meet Water Quality Standards for waters of the States of Oregon (Oregon Administrative Rules, Chapter 340-41) and Idaho through planning, application, and monitoring of Best Management Practices (BMP's) in conformance with the Clean Water Act, regulations, and federal guidance issued there to.
>
> **7. Stream Temperatures.** Prevent measurable temperature increases in Class I Streams. Temperature increases on SMU Class II (and fish bearing Stream Management Unit Class III) streams will be limited to the criteria in State standards. Temperatures on other streams may be increased only to the extent that water quality goals on downstream, fish-bearing streams will still be met. Normally, stream shade management on Class III streams will differ little from treatment on Class II streams.

Oregon State Water Quality Standards

In addition to meeting the Forest Plan standard, the Forest must meet Oregon water quality standards under the Clean Water Act. EPA approved new water quality standards for Oregon in March 2004. Streams in the aquatic effects analysis are considered "salmon and trout rearing and migration habitat" for Oregon water temperature standards. Therefore, the following water temperature standard applies:

The seven-day-average maximum temperature of streams identified as having salmon and trout rearing and migration use; may not exceed **17.8** degrees Celsius (**64.4** degrees Fahrenheit).

Amendment 29 DFC

1. Chinook and/or Westslope cutthroat trout spawning & rearing habitat - 7 Day Mean Max 55°F (12.8°C)
2. All other John Day Basin streams – 7 Day Mean Max 64°F (17.8°C) - *Amendment 29 specifies DFCs for temperature to result in compliance with Oregon State Water Quality Standards, including instantaneous reading at any time of less than 68°F (20°C) in all anadromous streams without Chinook, bull trout, or Westslope cutthroat trout spawning and*

rearing habitat. This water quality standard has been revised since Amendment 29 was issued, thus the revised standard is applied.

PACFISH RMO

1. No measurable increase in 7 Day Mean Max – *MNF data insufficient to determine whether this RMO is being met.*
2. Migration & rearing habitat - 7 Day Mean Max Below 64°F (17.8°C)
3. Spawning habitat - 7 day Mean Max Below 60°F (15.6°C)

Matrix of Pathways and Indicators:

STEELHEAD

1. Properly Functioning (PF): 7 Day Mean Max 50-57°F (10-13.9°C)
2. At Risk (AR): 7 Day Mean Max - Spawning habitat 57-61°F (13.9-16.1°C), Migration & rearing habitat 57-64°F (13.9-17.8)
3. Not Properly Functioning (NPF): 7 Day Mean Max - Spawning habitat >61°F (16.1°C), Migration & rearing habitat >64°F (17.8°C)

Table I-1 presents water temperature monitoring data for streams in the Fox and Hamilton allotments. Data sets range from a single year to as many as five consecutive years from 1996 to 2000. Locations of monitoring sites are shown in Figure I-1 for the Fox Allotment and Figure I-2 for the Hamilton Allotment.

Each table displays whether or not the temperature data meets or fails to meet each standard described above: 1) State water quality standards; 2) Amendment 29 DFC; 3) PACFISH RMO; and, 4) NMFS MPI. With very few exceptions, the data failed to meet each standard and would have a designation of NPF using the NMFS MPI for steelhead.

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Table I-1. Temperature data and relevant criteria for MCR Steelhead critical habitat streams in the Fox and Hamilton Allotments.

Stream Name and Map Reference Number	**Pasture**	**Years Analyzed**	**Mean Yearly Max of 7 Day Rolling Means of Daily Max (°F)** (7 Day Mean Max)	**Daily Max Over 64°F** (Mean Days Per Year)	**State Water Quality Standards** (Meet/Fail)	**303d Listed** (Y/N)	**Amendment 29 DFC** (Meet/Fail)	**PACFISH RMO** (Meet/Fail)	**MPI** (PF, AR, NPF)
Dunning Cr	Upper Fox / Fox	1996-2000	70.3	18.6	Fail 1	N[1]	Fail 1	Fail 2, 3	NPF
Fox Cr	Lower Fox / Fox	1997, 1999, 2000	72.2	54.3	Fail 1	N[1]	Fail 1	Fail 2, 3	NPF
Mill Cr	Lower Fox, / Fox	1998-2000	62.8	1.7	Meet 1	N	Meet 1	Meet 2 Fail 3	NPF
E.F. Deer Cr	East Fork / Hamilton	1993	68.6	Not Available	Fail 1	N[1]	Fail 1	Fail 2, 3	NPF

Notes: 1) MNF data indicates State Water Quality Standards are not being met, but Oregon DEQ determined the data was insufficient to include the stream on Oregon's 2004/2006 Integrated Report as 303d listed.

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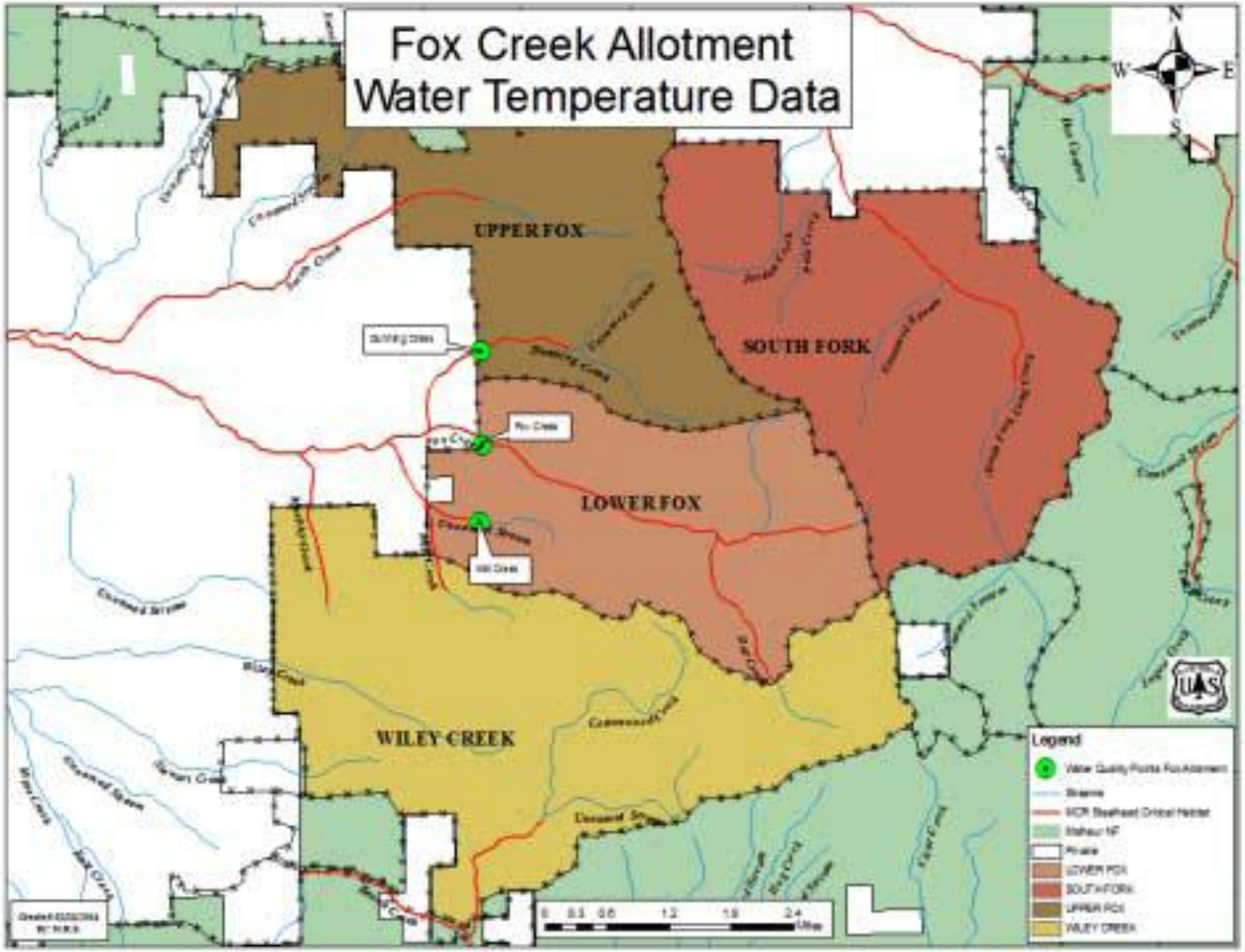

Figure I-1. Stream temperature monitoring sites within the Fox Allotment.

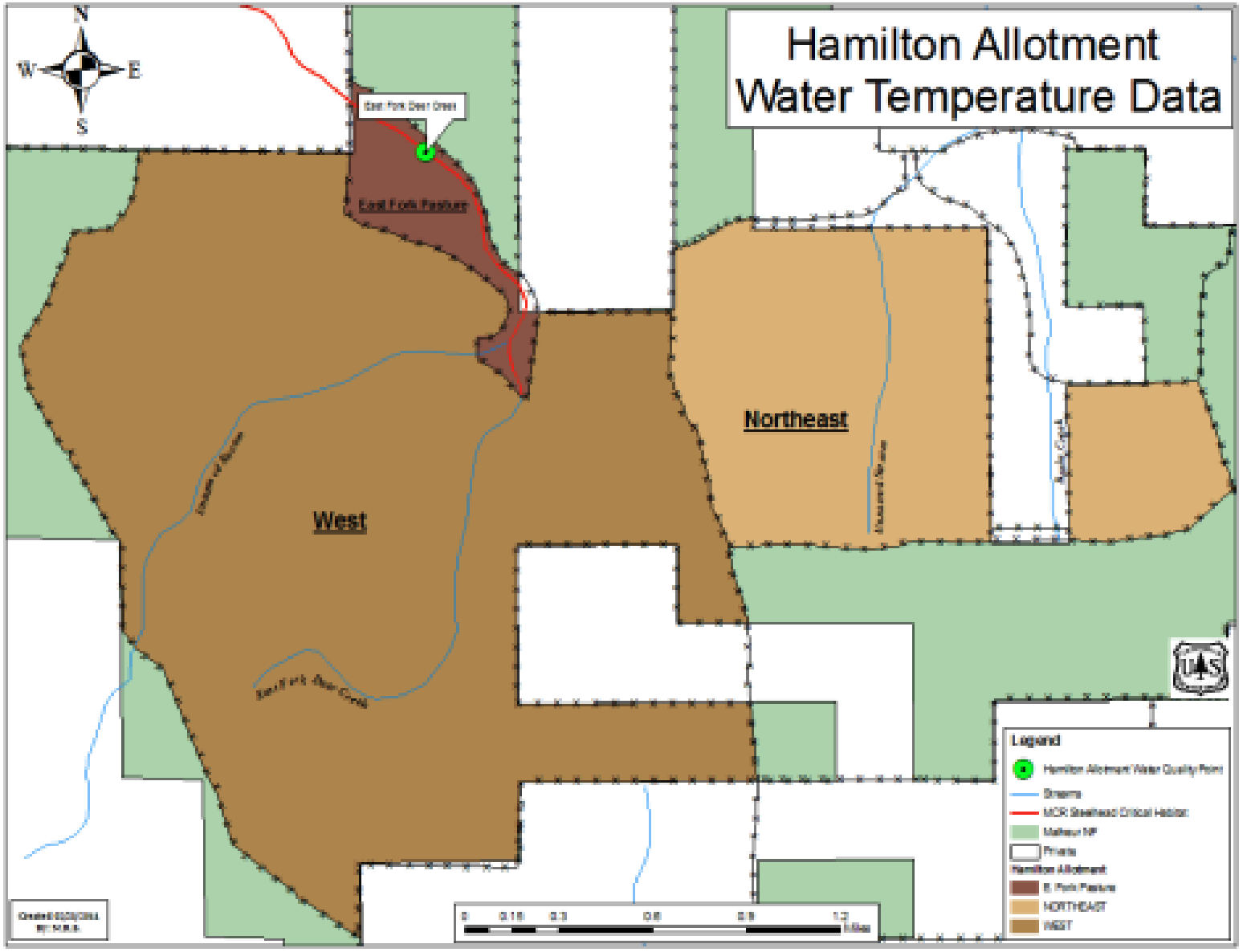

Figure I-2. Stream temperature monitoring site within the Hamilton Allotment.